

toxic aluminum salts may never be found, but in soils deficient in calcium and other bases, as in acid soils, toxic aluminum salts are largely the end products of sulphofication and nitrification. It is not denied that iron and manganese may become contributing factors in the unproductivity of some acid soils, but the preponderance of evidence points to aluminum as the determining factor in the acidity of the soils under investigation."—WM. CROCKER.

Soluble substances in soils.—MCCOOL and MILLAR⁸ have studied the rate at which substances become soluble in soils of various origins, types, ages, etc. The solubility was determined by the Bouyoucos freezing point method. The soils were leached free from soluble materials and then allowed to stand in water for various periods (5, 10, 30, and 60 days), and the freezing points determined at the ends of these periods. Contrary to the common view, soils from regions of lower precipitations are not more soluble than those from higher precipitations. The so-called new soils are less active than those somewhat older, and aged soils are almost inert. Subsoils liberate soluble salts very slowly, there being little activity below 6 inches. Sand particles are very inactive, and silts and clays are mainly responsible for the soluble materials. Grinding increases solubility. When soils were treated with 0.1N NaNO₃ and then washed free of soluble materials, the rate of dissolving was measurably affected. Western soils responded somewhat more readily than others. The Michigan Agricultural Experiment Station is studying this problem from several angles (composition of the soil, solutions on cropped and uncropped soils, residuary effects of salts on soils of different texture) and the work promises to be a valuable contribution to our knowledge of soil fertility.—WM. CROCKER.

Dormancy in trees.—COVILLE⁹ has emphasized the significance of cold in forcing trees out of their autumn dormancy. He finds temperatures of 32–40° F. the most effective, and emphasizes the transformation of starches to sugars as an important result of the low temperature. The effective temperatures agree well with those found for the after-ripening of dormant embryos in this laboratory.—WM. CROCKER.

Living stumps.—The continued growth of stumps and the healing over of the cut surface is not uncommon in the case of *Pseudotsuga*. PEMBERTON,¹⁰ investigating the phenomenon on Vancouver Island, British Columbia, finds the continued growth of the stumps due to the transference of food from living trees connected with stumps by means of subterranean root grafts. Instances are cited when growth ceased immediately with the cutting of the host tree.—GEO. D. FULLER.

⁸ MCCOOL, M. M., and MILLAR, C. E., The formation of soluble substances in soils taken from widely separated regions. *Soil Science* 10:219–235. 1920.

⁹ COVILLE, F. V., The influence of cold in stimulating the growth of plants. *Nat. Acad. Sci.* 6:434–435. 1920.

¹⁰ PEMBERTON, C. C., Living stumps of trees. *Amer. Forestry* 26:614–616. *figs. 6.* 1920.